

Knowledge and Psychomotor Objectives

Critical Care Endorsement

**Curriculum Objectives for the
EMT-Paramedic Critical Care Endorsement**

Montana Department of Labor and Industry Board of Medical Examiners

The purpose of the Critical Care Endorsement for EMT-Paramedic is to provide the EMT-Paramedic with the knowledge and skills to effectively and safely manage critically ill or injured patients during transfer between facilities under the oversight of a physician. The Critical Care endorsement is for those EMT-Paramedics who routinely perform inter-facility transports, the endorsement is not intended for every EMT. The skills identified in this endorsement and the approved Critical Care protocols are intended for inter-facility transfers, not 911 calls.

Patient care should always be based on patient presentation and the Montana Prehospital Treatment Protocols and or the Montana Inter-Facility Transport Protocols. Specific Board approved protocols exist for the Critical Care endorsed EMT-Paramedic and can be downloaded from the web site (www.emt.mt.gov)

EMT-P ENDORSEMENT: Critical Care

FORWARD

The Montana Board of Medical Examiners (BOME) developed the EMT endorsement process to provide the local EMS medical director the ability to expand the individual EMT scope of practice. The BOME has defined the “maximum allowable” skills for each endorsement and established statewide protocols. The endorsement process consists of education and verification.

The local EMS medical director is responsible for verifying an EMT’s knowledge and skills for a particular endorsement. This can be accomplished via a training program; or the medical director may take into account an EMT’s previous education, skill ability or other personal knowledge to determine whether an EMT meets the endorsement knowledge and skill requirements. The local medical director is responsible for the quality of all endorsement training via direct participation and/or oversight.

The medical director cannot exceed the scope of the endorsement, but may set limits on the ambulance service or the individual EMT. As an example, the medical director might wish the local ambulance service or an individual EMT to utilize pulse oximetry but not cardiac monitoring.

The endorsement material that follows provides the knowledge and psychomotor objectives at the specific endorsement level. Some endorsements may also include sample lesson plans for use in presenting the material. The endorsements (specifically at the EMT-Intermediate and EMT-Paramedic levels) may be non-specific in certain areas (such as specific medications or routes of administration) as the Board does not intend to “practice medicine”. The medical director “practices medicine” and has the ability to determine the specific’s concerning the endorsement. The Board approved protocols define the extent of the local medical directors flexibility: *“...The Board authorizes the service medical director to use the Board approved protocols in their entirety or may determine to limit individual EMT providers function / practice where appropriate and in accordance with provider’s abilities. However, the service medical director may not significantly alter (change the performance expectations of the EMT) or expand approved Board protocols without first seeking Board of Medical Examiners approval.”* If the medical director wishes to request the Board to “significantly alter” the protocol there is a process identified in the rules for that to occur.

The endorsement levels at the EMT-Paramedic level are slightly different then at the other levels in that all of the endorsement levels are subsets of the Critical Care endorsement. Therefore if a Critical Care endorsement is granted to an EMT-P, they have completed all of the other endorsements.

This does not work in reverse though, if an EMT-P has all of the endorsement levels but Critical Care, Critical Care is not granted by default.

The endorsement process requires that the medical director complete a standardized "verification form" (certificate of completion) documenting that an individual EMT has the knowledge and skills identified at the specific endorsement level. The individual EMT then submits an application to the Board to establish the endorsement on their license. The medical director then has the option of granting permission to the individual EMT to perform the endorsement to the extent defined by the medical director. All forms and endorsement materials can be obtained from the web site; www.emt.mt.gov. Any questions or concerns can be addressed to Ken Threet at (406) 841-2359 or kthreet@mt.gov.

Knowledge and Psychomotor Objectives

CONCEPTS AND COMPONENTS OF CRITICAL CARE TRANSPORT

Describe the history of ambulance transports.

Name three examples of Critical Care Transport Team composition configuration.

Identify and describe the preferred qualifications of a Critical Care Transport Paramedic.

Name six advanced procedures performed by a Critical Care Transport Team.

Differentiate between routine and specialty equipment found on a Critical Care Transport unit.

Discuss the three modes of transport for the critically ill or injured.

Identify indications for critical care transport.

Describe the interfacility transfer process.

MEDICOLEGAL ASPECTS OF CRITICAL CARE TRANSPORT

Apply the essential legal principles necessary to the practice of emergency medicine to the job of the critical care paramedic.

Recognize and discuss the legal risks and liabilities involved in critical care transportation.

Apply basic risk management principles to critical care transport.

Discuss the fundamental elements of litigation, hearings and peer-review proceedings.

Understand EMTALA and the implications for EMS

State the appropriate steps for accepting a patient transfer

State the appropriate steps in assessing and preparing for transfer

State CCEMT-P responsibilities during transfer

State the role of other health care providers who accompany the patient

State the appropriate steps to transfer care to the receiving facility

Appropriately document the transfer

Identify areas of potential liability

State methods to minimize risk
Be familiar with current case law regarding transport

LABORATORY DATA INTERPRETATION

Describe the relationship between laboratory medicine and the diagnosis and treatment of patients.

Describe the common problems associated with specimen collection and ways to avoid these problems.

Identify mean lab values and deviations for the complete blood count, the differential blood count, and platelet values.

Interpret arterial blood gas data.

Interpret chemistry studies.

Interpret urinalysis.

Describe the purpose of culture and sensitivity tests.

Interpret miscellaneous lab studies.

SHOCK

Define shock.

Discuss the major pathophysiologies of shock.

Describe how assessment techniques can help identify shock.

Describe the general management principles for the patient in shock.

Describe pharmacological intervention in different types of shock.

MULTI-SYSTEM ORGAN FAILURE

Define multisystem organ failure.

List the history, signs, and symptoms of the patient with sepsis.

Describe the management of the patient with sepsis.

List the history, signs, and symptoms of the patient with acute respiratory distress syndrome (ARDS).

Describe the management of the patient with ARDS.

List the history, signs, and symptoms of the patient with disseminated intravascular coagulation (DIC).

Describe the management of the patient with the management of the patient with DIC.

INFECTION CONTROL & COMMUNICABLE DISEASES

Describe proper infection control procedures that the Critical Care Transport Paramedic should take when treating patients.

Identify the mode of transmission and precautions to follow when treating a patient with the following infectious diseases:

HIV

Hepatitis

Multiple-Antibiotic Resistant Bacteria

Tuberculosis

Meningitis

BREATHING ASSESSMENT AND PULMONARY PHYSIOLOGY

Assess oxygen saturation using a pulse oximeter.

Assess carbon dioxide levels using an end tidal CO₂ detector.

Identify the categories of information obtained through an ABG analysis.
Describe the technique for drawing an ABG.
Describe important landmarks and anatomical structures of the chest wall and respiratory system.
Describe two factors important in the generation of breath sounds.
Describe how to assess breath sounds for duration, pitch, and intensity.
Identify auscultatory sites for breath sounds assessment.
Define normal and adventitious breath sounds.
Define consolidation.
Perform vocal and tactile fremitus assessments of lung fields.
Define and describe abnormal respiratory patterns.
Define and describe respiration and ventilation abnormalities.
Perform a complete respiratory assessment.

PLEURAL DECOMPRESSION

Identify indications for pleural decompression.
Discuss methods for pleural decompression assessment.
Describe the procedure for pleural decompression.
Differentiate between normal and abnormal assessment findings.
Identify transport complications associated with pleural decompression.

CHEST TUBE MANAGEMENT

Identify indications and purpose for chest tubes.
Discuss methods for chest tube assessment.
Differentiate between normal and abnormal assessment findings.
Describe the procedure for chest tube placement.
Identify transport complications for chest tubes.

PORTABLE VENTILATORS

Identify indications and purpose for portable ventilators.
Discuss methods for ventilator assessment.
Differentiate between normal and abnormal assessment findings.
Describe the procedure for placing a patient on a portable ventilator.
Identify transport complications of portable ventilators.

ET TUBE AND TRACHEAL SUCTIONING

Identify indications for ET tube and tracheal suctioning.
Describe the procedure for ET tube and tracheal suctioning.
Identify complications of ET tube and tracheal suctioning.

MAINTENANCE OF PARALYSIS AND SEDATION DURING VENTILATOR TRANSPORT

Provide Overview of RSI
Identify pharmacologic agents utilized during ventilator transports.
Describe why sedative medications should usually accompany the use of paralytic agents.
Identify transport considerations for patients intubated with the RSI technique.

TRACHEOSTOMIES

Identify indications and purposes for a tracheostomy.
Identify criteria for tracheostomy assessment.
Differentiate between normal and abnormal assessment findings
Describe the procedure for tracheostomy placement.
Identify transport complications of tracheostomies.

NEEDLE CRICOTHYROTOMY

Identify indications and purpose for needle cricothyrotomy.
Identify criteria for needle cricothyrotomy assessment
Describe the procedure for needle cricothyrotomy.
Differentiate between normal and abnormal assessment findings.
Identify transport complications for needle cricothyrotomy.

SURGICAL CRICOTHYROTOMY

Identify indications and purpose for surgical cricothyrotomy.
Identify criteria for surgical cricothyrotomy assessment
Describe the procedure for surgical cricothyrotomy.
Differentiate between normal and abnormal assessment findings.
Identify transport complications for surgical cricothyrotomy.

RETROGRADE INTUBATION

Discuss the indications and purpose for retrograde intubation.
Identify criteria for retrograde incubation.
Describe the procedure for retrograde intubation.
Differentiate between normal and abnormal assessment findings.
Identify transport complications for retrograde intubation.

INVASIVE LINES

Differentiate between types of invasive lines
Identify indications for invasive lines
Discuss methods for assessing invasive lines
Differentiate between normal and abnormal assessment findings
Identify transport complications of invasive lines

BLOOD ADMINISTRATION

Differentiate between antigens, natural antibodies and acquired antibodies
Identify antibodies and antigens associated with specific blood types
Define Rh factor
Identify seven types of blood component therapy
Identify indications for blood administration
Describe the procedure for blood administration
Identify the signs and symptoms of transfusion reactions
Describe the management procedures for transfusion reactions
Describe the indications for administration of whole blood and packed red blood cells
Describe the indications for typing, screening and cross matching blood
Describe the ABO system for matching blood

Describe the characteristics of blood products

Describe the procedure for administration of whole blood or packed red blood cells.

12-LEAD ELECTROCARDIOLOGY

Describe the difference between monitoring and assessing a patient using an ECG machine

Demonstrate proper lead placement for a 12 Lead ECG

Using a simple chart and leads I,II,and III, determine the electrical axis and the presence of fascicular blocks (hemiblocks)

Using lead V₁(MCL₁), determine bundle branch blocks

Describe the clinical significance of hemiblocks and bundle branch blocks in the cardiac patient

Describe the strategy for identifying V-Tach in wide complex tachycardia

On a 12-Lead or Multi-Lead ECG, identify ST and T wave changes relative to myocardial ischemia, injury and infarction.

Describe a systematic "assessment" of a 12-Lead ECG

Describe possible complications of various infarct locations

IMPLANTABLE CARDIOVERTER DEFIBRILLATORS

Discuss the incidence of sudden cardiac death and the population at risk

Describe how and Implantable Cardioverter Defibrillator (ICD) works, its components and its functions

Identify the potential complications associated with the ICD and location of placement in the chest wall

Describe the procedure for deactivating an ICD with a magnet

CARDIAC PACEMAKERS

Understand the basic concepts underlying cardiac pacemaker technology

Understand the current code system used for cardiac pacing

Understand and troubleshoot the potential rhythms that indicate forms of pacemaker malfunctions

SEDATIVES

Identify the indications, mechanism of action, pharmacokinetics, dosing and side effects of haloperidol

Identify the mechanism of action of benzodiazepine drugs

Compare the dosing and side effects of diazepam, lorazepam and midazolam

Identify the indications, mechanism of action, pharmacokinetics, dosing and side effects of flumazenil

Identify the indications, mechanism of action, pharmacokinetics, dosing, side effects, drug interactions and administration considerations of propofol

ANALGESICS

Identify the mechanism of action, pharmacokinetics, and side effects of morphine

Identify the mechanism of action, pharmacokinetics, and side effects of naloxone

PARALYTICS

Identify the mechanism of action, pharmacokinetics, and toxicity of Succinylcholine

Identify the indications, mechanism of action, pharmacokinetics, side effects and drug interactions of pancuronium, vecuronium and atracurium
Identify the order of paralysis
Discuss the adverse effects of prolonged paralysis
Identify the role of “train of four” monitoring when using paralytics

ANTI HYPERTENSIVES

Compare the mechanism of action, dosing, pharmacokinetics, and adverse effects of captopril, nifedipine and clonidine
Identify the mechanism of action, pharmacokinetics, dosing, toxicity and administration considerations of nitroprusside
Identify the mechanism of action, pharmacokinetics, dosing and adverse effects of labetalol
Identify the pharmacology, pharmacokinetics, dosing and toxicity of diazoxide

VOLUME EXPANDERS

Compare the advantages and disadvantages of crystalloids and colloids
Compare the use, dose and adverse effects of albumin, plasma protein fraction, Hetastarch and Dextran

VASOPRESSORS

Identify the indications for vasopressors
Compare the effects, dosing and adverse effects of dopamine, epinephrine, norepinephrine (Levophed), phenylephrine and dobutamine

BRONCHODILATORS

Identify the pharmacology and effects of beta receptor stimulation for beta agonists
Compare the pharmacokinetics, dosing, delivery, and adverse effects of albuterol, epinephrine and terbutaline
Identify the pharmacology, metabolism, adverse effects, drug interaction and dosing of metoprolol and theophylline
Identify the pharmacology and dosing of anticholinergics
Compare and contrast anticholinergics and beta agonists
Identify the pharmacology and uses of magnesium

ANTIARRHYTHMICS

Identify the mechanism of action, ECG effects, uses, pharmacokinetics, dosing and toxicity of Class IA antiarrhythmic drugs
Identify the mechanism of action, ECG effects, uses, pharmacokinetics, dosing and toxicity of Class IB antiarrhythmic drugs
Identify the mechanism of action, ECG effects, and uses of Class IC antiarrhythmic drugs
Identify the mechanism of action, ECG effects, and uses of Class II antiarrhythmic drugs
Identify the mechanism of action, ECG effects, uses, pharmacokinetics, adverse effects and drug interactions of Class III antiarrhythmic drugs
Identify the mechanism of action, ECG effects, and uses of Class IV antiarrhythmic drugs

Compare the pharmacokinetics, dosing and adverse effects of verapamil and diltiazem

Identify the mechanism of action, ECG effects, uses, pharmacokinetics, administration considerations, drug interactions and toxicity of adenosine

ANTIANGINALS

Identify the pharmacology, dosage forms, pharmacokinetics, administration considerations, adverse effects, and tolerance considerations of nitrates

Identify the uses, side effects and patient selection criteria for beta blockers

Identify the uses, contraindications, and side effects of calcium channel blockers

THROMBOLYTICS

Identify the absolute and relative contraindications to thrombolytic therapy

Compare the pharmacology, pharmacokinetics, dosing and adverse effects of TPA, streptokinase and APSAC

Discuss the benefits of thrombolytic therapy

ANTICOAGULANTS

Identify the mechanism of action, dosing, and clinical trial findings of aspirin as an anticoagulant

Identify the mechanism of action, dosing, monitoring parameters, adverse effects and clinical trial results of heparin

Identify the pharmacology, indications, monitoring parameters, drug interactions and adverse effects of warfarin

ANTIBIOTICS

Identify the pharmacology and uses of antibiotics

ETOMIDATE

Identify the indications, mechanism of action, pharmacokinetics, and side effects of etomidate

GI, GU and RENAL ASSESSMENT

Identify GI/GU assessment criteria

Differentiate between normal and abnormal assessment findings

NG and OG FEEDING TUBES

Identify the indications for a nasogastric and orogastric tube

Discuss methods for nasogastric and orogastric assessment

Differentiate between normal and abnormal assessment findings

Describe procedure for placement of nasogastric and orogastric tubes

Identify transport complications associated with nasogastric and orogastric tubes.

URINARY CATHETERS

Identify indications and purpose for Foley catheters

Discuss assessment methods for Foley catheters

Differentiate between normal and abnormal assessment findings

Describe procedure for Foley catheter placement

Identify transport complications for Foley catheters

OSTOMIES

Identify indications for an ostomy

Discuss methods for ostomy assessment

Differentiate between normal and abnormal assessment findings

Discuss methods for ostomy placement

Identify transport complications for ostomies

HEMODIALYSIS and PERITONEAL DIALYSIS

Identify indications and purpose for dialysis

Differentiate between hemodialysis and peritoneal dialysis

Describe the procedure for accessing arteriovenous shunts

Identify transport complications of dialysis patients

RECTAL CONSIDERATIONS

Describe the rectal anatomy and structures

Classify rectal bleeding: red, bright red, melena

Discuss incontinence, diarrhea and constipation management techniques

Demonstrate rectal temperature assessment technique

Describe decubitus ulcers

NEUROLOGICAL ASSESSMENT

Describe the major components of a neurological examination

Describe the differences in the neurological assessment between a brain injured or spinal injured patient

Perform a neurological examination

Describe the findings of a normal and abnormal neurological examination

Describe vital signs changes noted with neurological injuries

Identify transportation considerations for patients with neurological injuries

NEUROLOGICAL ASSESSMENT LAB

Correctly perform a neurological assessment

Document the findings of a neurological examination

INTRACRANIAL PRESSURE

Describe intracranial pressure (ICP)

Describe the pathophysiology of ICP

Define compliance

Explain herniation of the brain

Describe how to calculate cerebral perfusion pressure (CPP)

Identify signs and symptoms of increasing ICP

Identify factors that will increase ICP

Identify consequences of increased ICP on patient outcome

Identify strategies and methods for decreasing ICP during critical care transport

TRANSPORTS: START TO FINISH

Differentiate operational aspects of critical care transport and conventional prehospital care

Identify four major opportunities for positive interaction that exist during a critical care transport
Incorporate prospective medical control into the care of critical patients
Identify critical decision points in a transport event
Develop an event flow sheet
Identify essential patient perceptions of quality service
Understand the role of family members in critical care transport
Recognize situations warranting diversion or interception
Incorporate unique management tactics with moribund patients and families

PEDIATRIC CONSIDERATIONS

Identify various histories and general principles for pediatric assessment
Define the primary cause of cardiac arrest and list several risk factors
Describe principles of general treatment before and during the transport of a pediatric patient

OBSTETRICAL/GYNECOLOGICAL CONSIDERATIONS

Identify various histories and general principles for OB/GYN assessment
Define the primary cause of cardiac arrest and list several risk factors
Describe principles of general treatment before and during the transport of a OB/GYN patient

BURN CONSIDERATIONS

Identify various histories and general principles for burn assessment
Define the primary cause of cardiac arrest and list several risk factors
Describe principles of general treatment before and during the transport of a burn patient

X-RAY CONSIDERATIONS

Understand the basic concepts underlying X-ray interpretation
Describe a systematic "assessment" of an X-ray

CASE STUDIES

Integrate topics learned with case scenarios